



YRG CARE

Chennai-based Suniti Solomon discovered the first HIV case in India and has received funding through USAID's APAC project

HEALTH SUPPORT SYSTEM

Diseases know no frontiers. It's a fact both the United States and India are conscious of. For more than 35 years, the two countries have been partners in biomedical research and combating diseases, ranging from HIV to polio. The United States can boast a formidable arsenal in this war—U.S. Department of Health and Human Services' institutes like the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC) and USAID are indisputable leaders in the field. Nearly Rs 920 crore (\$200 million) been invested by the Department of Health and Human Services on public health-related projects in India. Now the interaction is continuing through an increasing number of NIH research grants, CDC technical assistance, and bilateral programs in areas as diverse as HIV/AIDS, tuberculosis, polio management and health infrastructure development. These programs have not only saved millions of Indian lives, but have strengthened the bonds between the people of two countries. The National Institutes of Health currently support nearly 80 projects in India. At any given time, 150 Indian scientists are undergoing postdoctoral research training on the NIH campus.

The National Institutes of Health maintain collaborative programs on HIV/AIDS and Sexually Transmitted Diseases Prevention, Maternal and Child Health and Human Development Research Program, Brain Research Program, U.S. Department of Education Support, Disability Technology and Research Program, Contraceptive and Reproductive Health Research Program, and Vaccine Action Program. To build capacity in the field of disease surveillance and address issues of

AIDS PREVENTION BATTLING A SCOURGE

APAC HELPS SPREAD HIV/AIDS AWARENESS

Palani, a barber at Krishna Hair Dressers in Mahabalipuram, a small town in Tamil Nadu, is an unlikely social worker. Yet he plays a crucial role in spreading awareness about HIV/AIDS. He has been trained to talk to his customers about how to prevent the disease, provide leaflets, and direct customers to buy condoms at the drugstore next door. It is all part of the AIDS Prevention and Control Project (APAC), a highly successful program in Tamil Nadu funded by the United States Agency for International Development (USAID), along with the National AIDS Control Organization (NACO) and the State AIDS Control Society, to rein in the disease through prevention.

A number of factors are key to controlling HIV, including behavior modification, availability of safe blood supply and awareness of one's disease status. According to NACO, only 10% of HIV positive people in India are aware they have the infection. This is due to low awareness among people and because HIV testing is not easy to access. There are also issues of confidentiality and the attitude of service providers.

Thanks to other USAID funding, the Saadhan Clinic in Chennai can test and counsel patients at the subsidized rate of Rs 25. In the retail market, the test kits would cost 10 times as much. Steps like these have already made a difference. As more agencies step in, Tamil Nadu may no longer be in the red zone on India's HIV map.

emerging and re-emerging infectious diseases, CDC maintains programs in Emerging and Re-emerging Diseases Surveillance and Environment and Occupational Health Research.

Department of Health and Human Services' (HHS) collaboration in India, says Dr. Altaf A. Lal, Health Attaché and HHS Regional Representative for South Asia, is aimed at jointly working for the development of knowledge, technology, tools of disease control and prevention (such as vaccines, drugs, and diagnostics), and the elimination of infectious diseases. "The benefits from these collaborations flow to the Indian and American people, as well as to the global community and through goodwill, they also add momentum to the growing U.S.-India relationship," says Dr. Lal.

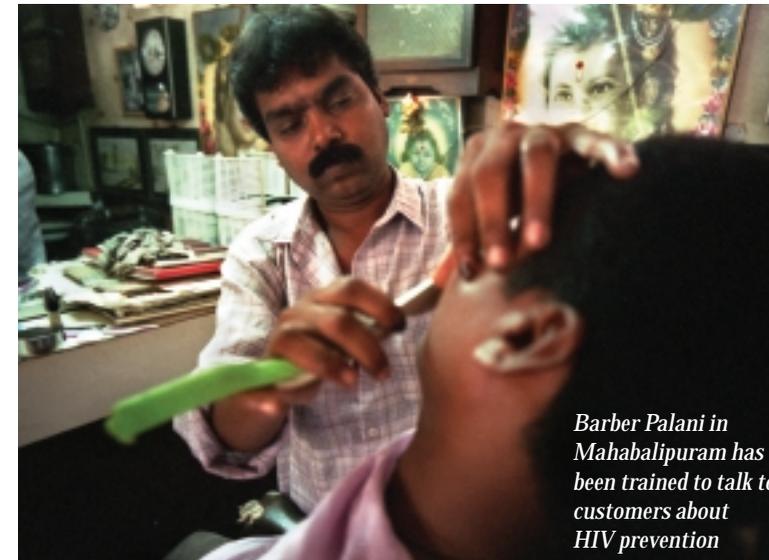
The bilateral partnership extends to health policy issues too. The Indo-U.S. Biomedical Research Policy Forum was established in 2000 to provide a platform for debates and discussions. Some of the issues in focus include intellectual property rights, public-private partnerships in health, sharing research tools, cell line and data, protection of human and animal subjects in research, and streamlining procedures for clearing joint research proposals. There are numerous other areas where U.S.-India partnerships have made a discernible difference in public health.

HIV/AIDS

The first case of HIV infection in India was officially reported in 1986. It then seemed a mere blip on an already overloaded health system. Today, with 4.5 million infected—almost 1% of adults—some fear the country could be sitting on a large rumbling volcano. The U.S. Government spotted the danger early, and responded in 1992 by developing the 10-year AIDS Prevention and Control (APAC) activity in Tamil Nadu, one of India's six high prevalence states. Its efforts focused on groups who engage in "high-risk" behavior, such as sex workers and truck drivers. The program sought to control the spread of the virus by engaging in strategies for changing their sexual behavior. Since the presence of sexually transmitted diseases increases the chances of being infected with HIV several-fold, they also focused on increasing access to high quality condoms and the treatment of sexually transmitted diseases. The project is in its expansion phase and has increased its outreach and added care and support to its fold. Working with various local NGOs, APAC has made a dramatic difference in ensuring that high-risk

groups adopt and sustain safe behavior and that the disease does not spiral out of control, although the danger still remains. USAID expanded its program to include Maharashtra, which accounts for 25% of reported AIDS cases in India. Avert, a seven-year, Rs 190 crore (\$41.5 million) program focuses on prevention of the infection among high-risk groups, such as sex workers, in many high prevalence districts of Maharashtra, besides addressing care and support issues. Similarly, Operation Lighthouse, another USAID funded program, focuses on HIV/AIDS prevention in the 12 major port communities across India. Port communities are crucial as many "high risk" groups converge there, yet they have not received due attention in the war against the virus.

BARRY FITZGERALD



Barber Palani in Mahabalipuram has been trained to talk to customers about HIV prevention

The most heart-breaking rendition of the tragedy of HIV/AIDS is seen in its innocent victims, children. USAID's Implementation of AIDS Prevention and Care (IMPACT) project, implemented by Family Health International (FHI) in Tamil Nadu, Andhra Pradesh, Delhi and Maharashtra, provides support for children infected/affected by AIDS, in addition to prevention and care demonstration projects.

A combination of Indian expertise in Information Technology and U.S. management skills are helping to fight the disease.

The Centers for Disease Control and Prevention (CDC) is strongly committed to assisting the Government of India with its HIV epidemic through its Global AIDS Program (GAP). In 2001, the U.S. Congress provided additional funding of Rs 13.8 crore (\$3 million) a year to CDC for HIV/AIDS projects in India. CDC and the Government of Tamil Nadu are working with Satyam Computers to develop a system that would provide information to improve patient care. With more than 400,000 records already entered, Indian health care providers and U.S. epidemiologists are now working together to develop ways to use that information so that it provides maximum benefit to patients. At the same time, CDC is assisting in renovating laboratories to improve clinical diagnoses, as well as assisting in developing training curriculum for health care providers. CDC is also supporting NGOs and people living with HIV/AIDS to develop programs to improve care and support in the home and community.

The National Institutes of Health is supporting cutting-edge research on HIV/AIDS in India, with focus on vaccine development and testing, behavioral research, mother to child transmission, and genetics and pathogenesis. NIH is also providing funding Rs 13.5 crore (about \$3 million) to the

National Institute for Research in Reproductive Health, Mumbai, for upgrading its non-human primate facility. The total budget of Indo-U.S. collaborative grants for this project is around Rs 45 crore (\$10 million) a year.

The U.S.-India partnership against HIV/AIDS stretches well beyond the governmental arena. HIV/AIDS in India has been an issue of such concern that the Bill and Melinda Gates Foundation agreed to invest Rs 920 crore (\$200 million) over five years for HIV/AIDS in India—the largest commitment to one country by the world's richest man, and the largest prevention program ever undertaken in the world. "The situation is urgent," says Ashok Alexander, country head of the Gates Foundation. "India is at the inflection point of the S curve that every epidemic shows. HIV is already a generalized epidemic in 6 states, and shows signs of a concentrated epidemic in others." Alexander, a former management consultant, used his skills to identify key areas that needed attention and formulated plans accordingly. One ambitious plan, in partnership with local NGOs, is to set up franchised booths along the national highway to provide information, socially marketed condoms, STI services and counseling. Another NGO supported by U.S. grants, "Positive People's Network," forms a network of HIV people so that, far from being on the fringes of society, theirs will be a collective voice that will be heard.

As HIV infection spreads, so does the rate of tuberculosis. India today houses a third of the world's TB patients. With financial help from USAID, medical epidemiologists from CDC, via the World Health Organization (WHO), are active in assisting the Indian Government in implementing the Directly Observed Treatment Strategy (DOTS) program. The Tuberculosis Research Center at Chennai has been identified as an international center for excellence in research for infectious diseases by NIH.

POLIO

Polio is a viral disease that devastates families by causing death or permanent paralysis in children and young adults. Because it only survives in human beings and an effective vaccine is available, the scourge of polio can be eliminated from the world forever, just as was done for smallpox. As a result of a massive global effort, by 2003 polio virus transmission had been eliminated from all but six countries in the world. These six include India, which has traditionally been the source of the largest number of cases. U.S. Secretary of Health and Human Services Tommy Thompson, during his 2004 visit to New Delhi, emphasized that the elimination of the disease in India is key to the success of the global program.

The Indian Government's battle to eradicate polio began in 1995 and the number of cases occurring each year dropped continuously through 2000. However, in 2002 a major outbreak occurred. This was due to a combination of a decreased number of nationwide immunization drives, reduced quality of the drives and suspicion of the vaccine among minority group members. During late 2002-03, the Indian Government and partners (including USAID and CDC) stepped up their efforts to improve immunization for polio. As a result, during 2003 India reported the lowest number of polio cases ever (225) and is on the verge of succeeding in the eradication drive.

From 2001 to 2004, CDC and USAID support for polio eradication in India exceeded Rs 265 crore

(\$59 million) and four senior CDC staff assigned to WHO are among the key technical and managerial advisors in the polio eradication activities in India. In 2003, following the epidemic, eight CDC National Immunization Program staff were sent to provide temporary technical and management assistance to the India WHO field operations. Working with Indian medical officers, they assisted in bringing down the number of cases to one of the lowest ever recorded. WHO now feels polio can be eradicated in India by 2004. And when it is accomplished, the CDC and USAID will have played a major role in this humanitarian victory.

NARENDRA BISHT/INDIA TODAY



USAID and HHS have helped in the war against polio in India

PUBLIC HEALTH AND DISEASE OUTBREAK

When SARS broke out in South East Asia, India was prepared. But India has had its own set of disease outbreaks. In 1994, plague broke out in Surat. Samples were sent to CDC in Atlanta for identification. In 2001, a mysterious fever of unknown origin broke out in Siliguri, West Bengal. Initially, Japanese Encephalitis was thought to be responsible. Samples, once again, were sent to CDC for identification. The causative agent turned out to be a virus similar to the Hendra virus of Australia and the Nipah virus of Malaysia, both of which are domestic animal-borne infections.

But the U.S.-India partnership in public health extends well beyond merely identifying disease-causing agents. It also aims to find

REPRODUCTIVE HEALTH

A SAFE DELIVERY

AN INNOVATIVE PROGRAM USES TRADITIONAL MEDIA

Folk shows with a message. Private-Public partnerships via district action plans. Social marketing, staff training, increased access to reproductive health camps. With imaginative strategies, the Rs1,462 crore (\$325 million) Innovations in Family Planning Services (IFPS) Project, supported by the U.S. Agency for International Development (USAID), has made a discernible difference to the lives of women in remote Uttar Pradesh.

U.S. Government aid to India for family planning and reproductive health stretches back to more than a decade. IFPS, begun in 1992, focuses on the state of Uttar Pradesh. Over 8,500 folk media performances on family welfare themes, backed by better access to care, have had an impact on the psyche of rural women in a way that official literature could never do. And it shows, in hard numbers.

Consequently, modern contraception use has increased nearly twice as fast. Due to social marketing activities, U.P. is the only state in India in which sales of oral contraceptive pills and condoms in rural areas have increased over the past two years. 45% of U.P. villages have an outlet selling these contraceptives. In pregnant women, tetanus toxoid immunization levels have increased from 33% in 1999 to over 62% in 2003. The program ensures that the next generation of Indians has a fighting chance of a healthy life.

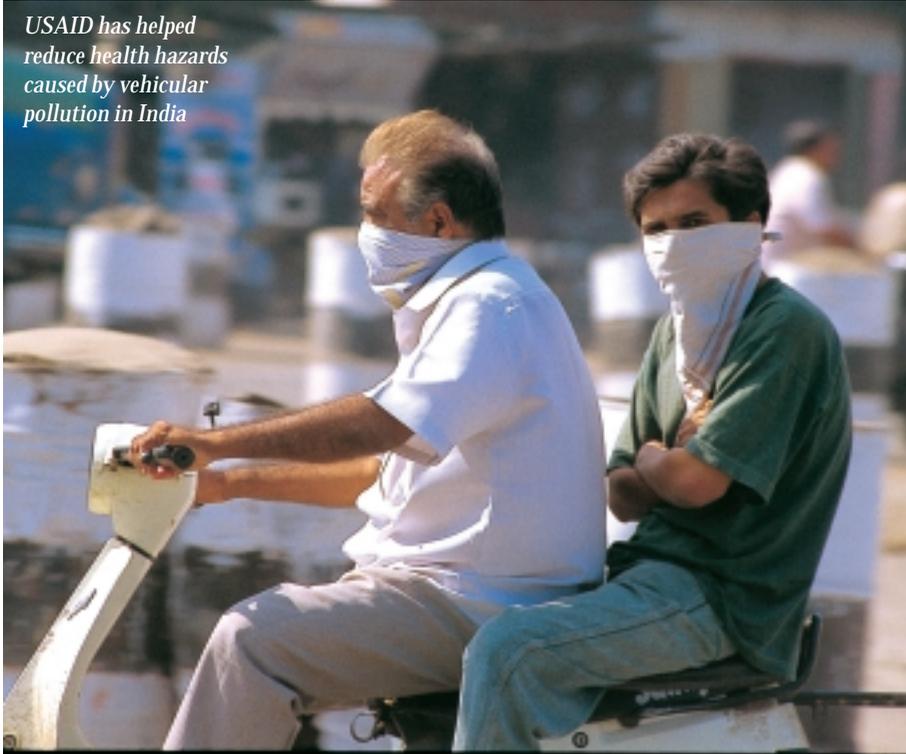
ROTAVIRUS VACCINE SAVING BABIES

U.S.-INDIA COLLABORATION HELPS DEVELOP DRUG

Every day in India, one out of every 200 babies born will die of a perfectly preventable cause—diarrhoea. This diarrhoea is caused by a virus called rotavirus, which kills more than 100,000 children every year. But two independent research teams, funded by the Indo-U.S. Vaccine Action Program (VAP), showed that in newborn nurseries, infants infected with parts of the rotavirus strains did not develop diarrhoea, but mounted a brisk immune response which protected them against future infections. In other words, a vaccine could save hundreds of new born lives. So the The India Rotavirus Vaccine Development Project was born under VAP, to produce and test a live, oral rotavirus vaccine to prevent severe diarrhoea in children.

Two candidate vaccines are now at the clinical trials stage, and both will be tested by investigators at AIIMS in India, Stanford University and CDC for the Phase I, II and III clinical trials. This collaboration will provide capacity building for a vaccine testing and evaluation center in India. Bharat Biotech International Ltd, a biotechnology company based in Andhra Pradesh, will develop, manufacture and evaluate the vaccines in India. It's a prime example of how governments (U.S. and India), academia (CDC, Stanford University, AIIMS, IISc), funding agencies (PATH, Bill and Melinda Gates Foundation) and the private sector (BBIL) can synergize their resources for the benefit of both nations.

*USAID has helped
reduce health hazards
caused by vehicular
pollution in India*



SHAILESH RAVAL/INDIA TODAY

solutions, and build effective infrastructures to meet any eventuality.

In a country where safe drinking water is hard to find, CDC and USAID have invested heavily in safe water and sanitation projects. Over Rs 18.4 crore (\$4 million) is spent annually in India on innovative projects for effective drinking water. Rs 1.84 crore (\$400,000) was invested in a project in the township of Valasaravakkam to lay pipes from a safe drinking water source to the town. Projects to find cheap and effective ways to collect and distribute safe water are on in Delhi and Uttaranchal. Funded by USAID, the NGO Population Services International (PSI) markets Saf Wat Jar, a vessel that purifies water.

Training people in public health forms the core of the U.S.-India alliance. The belief is that this is the only way to ensure the spread of health awareness. With technical support from HHS, several district schools of Public Health will be set up across India. Laboratory infrastructure will be developed or upgraded as well, so that in case of any disease outbreak, diagnosis and identification of the cause can be done immediately and suitable measures can be taken to bring the outbreak under control.

VACCINES

As the Government of India launches aggressive campaigns for the prevention of the myriad diseases that threaten this country, the United States has backed them every step of the way. India's Ministry of Health and Family Welfare, as well as the Department of Biotechnology, encourages research of affordable, effective vaccines. There have been numerous successes in this area in the recent past. And many of them have been possible because of U.S. funding or expertise.

One of the most important vaccine projects under way in India is the HIV vaccine. A joint project between the New York-based NGO International AIDS Vaccine Initiative (IAVI), Indian National AIDS Control Organization (NACO) and the Indian Council for Medical Research, it aims to develop a vaccine that will be effective against the HIV 1c strain that is dominant in India. The vector *Vaccinia ankara* is being used as the vector. In August 2003, Mark Chataway, IAVI's Indian team leader, announced that clinical trials for the vaccine would begin in 2004.

While HIV remains a cause for grave concern to many Indians, malaria poses a more immediate danger. It is caused by the parasite *Plasmodium falciparum* and *Plasmodium vivax*, transmitted through mosquito bites. Nearly 65% of all malaria cases in India are caused by *P. vivax*. It is in this area that the U.S.-India collaboration Malaria Vaccine Initiative has been particularly successful.

NARENDRA BISHT/INDIA TODAY



*The U.S. encourages
bilateral research on
the development of
affordable vaccines*

A NIH-trained scientist, Chetan Chitnis, working in the New Delhi-based International Centre for Genetic Engineering and Biotechnology (ICGEB), developed a candidate vaccine for *P. vivax*. He was supported by the Malaria Vaccine Initiative at PATH (Program for Appropriate Technology in Health), a U.S.-based non-profit organization. This PATH initiative was made possible by a Rs 675 crore (\$150 million) seed grant from the Bill and Melinda Gates Foundation. It will now be developed and eventually marketed by an Indian biotechnology company, Bharat Biotech India Ltd. The first phase of human clinical trials will take place in Mumbai. Another malaria vaccine that targets *P. falciparum*, which is the most lethal form of malaria and causes almost all malaria-related mortality, is the subject of collaboration between CDC and Bharat Biotech International Limited. This vaccine effort, which was headed by Health Attaché Dr. Lal when he was at CDC, is designed to target multiple stages of the parasite simultaneously. The vaccine development work is continuing at CDC and the CDC team is also working with the Indian Council of Medical Research toward the development of a testing site for malaria vaccines.

DR. ROGER GLASS / CENTER FOR DISEASE CONTROL AND PREVENTION



And it worked. The viral strains were collected from M.K. Bhan of AIIMS and Prof. C. Durga Rao of the Indian Institute of Science (IISc). They were sent to CDC, where Dr. Roger Glass noted that they were human-bovine “reassortment” strains, which meant that the virus had both human and bovine genes. They noted that this viral strain caused no symptoms in infected children, but raised their immune response, so that they were protected from more virulent strains of rotavirus. NIH then made pilot lots of the vaccine for testing, and after initial safety tests in the U.S., they are now being tested at AIIMS, under the U.S.-India Vaccine Action Program.

To be effective, vaccines must be preserved under harsh Indian climatic conditions. Research supported by the Gates Foundation has developed vaccine vials, which change color from white to purple when the vaccine is no longer usable. This technology is being widely used in India, but not yet in the United States—proving that benefits of bilateral health programs can go both ways.

HIV and malaria are not the only success stories in terms of vaccines. One of India’s biggest tragedies is the death of more than half a million children every year due to diarrhoea. A virus called rotavirus is often responsible for diarrhoea in India. So the CDC, NIH, All India Institute of Medical Sciences (AIIMS), Stanford University, Bharat Biotech and the Gates Foundation pooled their resources to develop a vaccine for this virus.

ORS AND CHILD HEALTH

While vaccines prevent children from getting diarrhoea, there is a simple, cheap way to save a child who is suffering from the disease. Children with diarrhoea die from dehydration rather than the virus. Oral Rehydrated Salts (ORS), a carefully balanced solution of glucose, potassium and sodium, has been scientifically shown to provide better rehydration, and save children’s lives. However, in the past usage was poor, because awareness was low and superstitions were high.

VIKAS NARULA



U.S. Secretary of Health & Human Services Tommy Thompson visited India to discuss cooperation on improving the health of children

awareness sessions were launched for doctors and nurses.

The campaign was launched in urban areas of eight north Indian states. The results were spectacular. Before the campaign was launched, WHO-ORS was available in only 23% of the chemist outlets. By 2003, availability had increased to 65% of chemist outlets in the campaign area. ORS sales have increased by 23% and WHO-ORS brands by 63%. The use of ORS among children with diarrhoea has increased from 26% in 1998-99 to 50%. And no statistics can quantify the joy of parents whose children have been saved.



USAID launched a successful campaign on the use of ORS for children suffering from diarrhoea

Training in public health is the core of the U.S.-India alliance. This is the best way to increase awareness, control and prevent infectious diseases.